common design concepts for the learning car mechanic

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by Magnolia Crescent

PART NUMBERS_

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(AND A LITTLE ABOUT SERVICE DATA)

Welcome to a printed booklet full of computer screenshots--it's the 90s!!

How do I find the part I need? What if the store has never heard of it? Do the part numbers mean anything? And how do I get information about how to install it? Let's dive into the methods at our disposal to find parts.

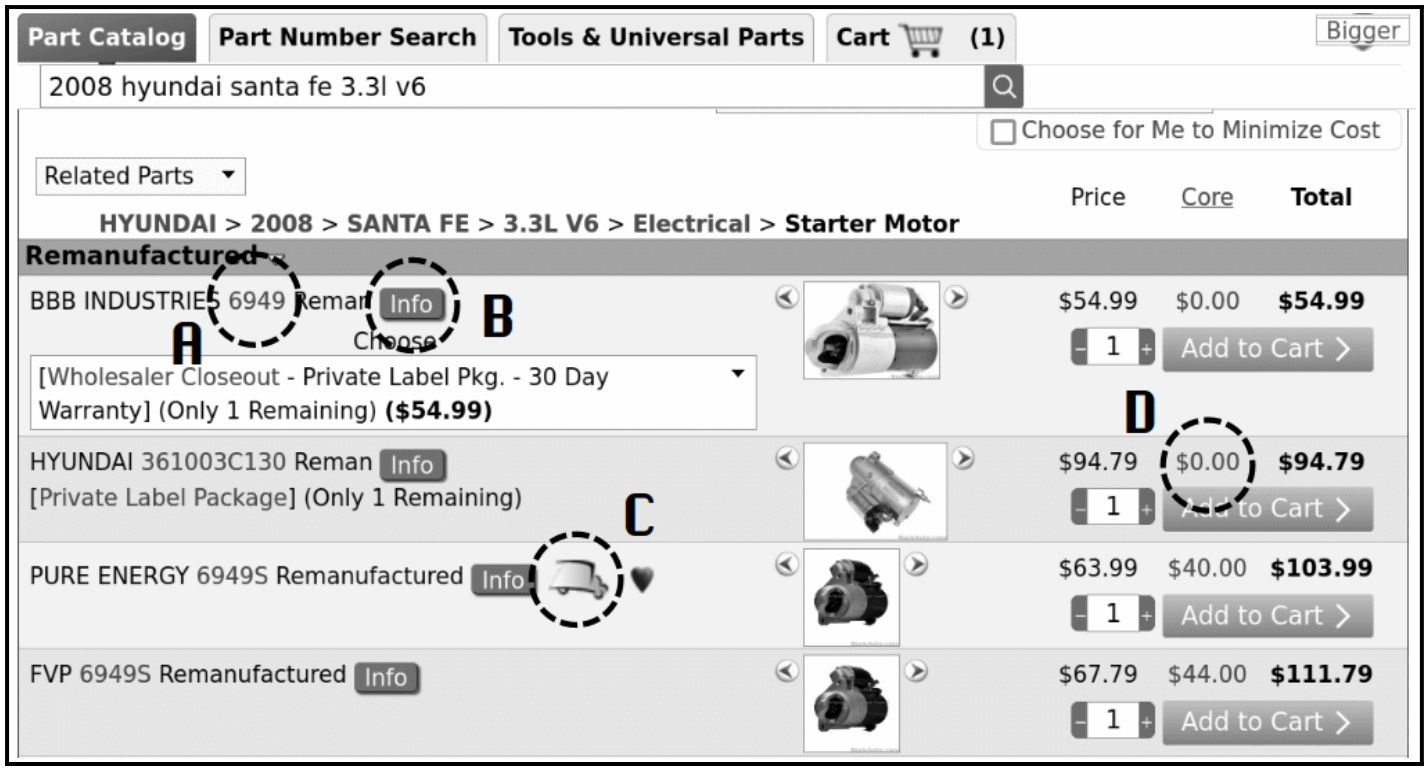
When a car company makes a car, they give every part a number. For example, my Hyundai Santa Fe starter is 361003C130. That starter is the original equipment manufacturer's starter, called the OEM starter for short. When an aftermarket manufacturer makes a starter for that car, they give it their own part number, which makes sense, because the individual pieces inside it (brushes, bearings, etc.) were made in a different factory from different materials.

The number identifies the manufacturer, which helps you say, "god damn it, SKP, this ball joint fell apart two weeks after I installed it!" It also identifies the production run, which helps you say, "is this one of the Kia TCMs they had to recall because some of them spontaneously caught fire?" Part numbers aren't serial, so they don't identify individual parts within a production run.

Once you have some part numbers, you can easily find the part anywhere: a parts store, an online retailer, the dealer, ebay, whatever. Usually, a general internet search for the number will turn up places to buy it, if your usual supplier doesn't have it. If it doesn't, look at the number carefully--if there are multiple strings of digits separated by hyphens, try searching for just one string, plus the car's make. Sometimes one string identifies the car or system on the car and the other is the part. If there are a bunch of digits and one letter, try leaving out the letter.

ROCKAUTO

The first thing I do is search for the part on rockauto.com. I'm not suggesting you buy anything from them (or anyone else--I don't endorse capitalists), I just use their website to find information because they have the easiest search and the most complete interchange. They don't manufacture anything, they just handle sales for a bunch of different companies and warehouses, so you have a lot of options for each part, although usually most of them are bad and/or the same thing. Here's a breakdown of what information you can get from them:



A. this is the part number. Click on it to see a list of every vehicle rockauto thinks it fits on. I got lucky here because the second starter is OEM, so I also got the OEM part number and that can be useful.

B. clicking INFO sometimes shows specifications for the part, like its dimensions. Can be useful if you want to measure the one you have to make sure the new one will fit.

C. the truck symbol means it comes from the a warehouse from which you're already having something shipped. If you buy from them, you can try to get everything from the same warehouse to save on shipping. Sometimes taking things in and out of your cart in different sequences will make them come from different places. I don't know why.

D. a core charge or core deposit is part of the cost of the part, but you'll get it back if you mail them your old one. You only really see this on parts that can be rebuilt, like starters. Parts stores have core charges too. Doesn't

matter how destroyed the old one is, they just want the pieces.

OEM SITES

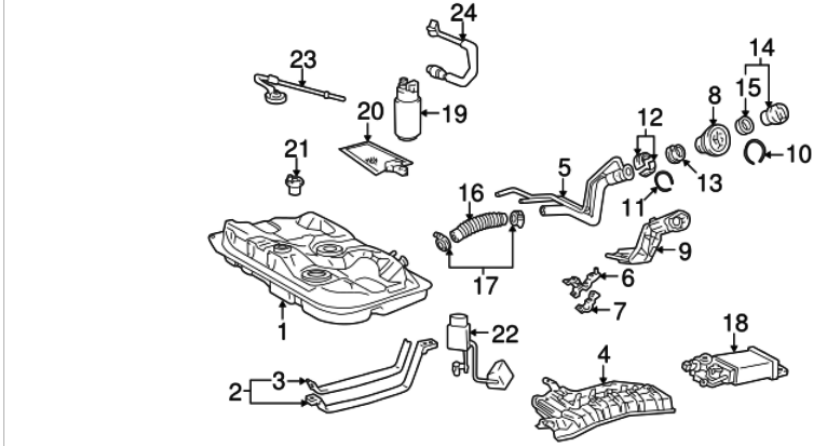
Sometimes Rockauto doesn't have what I'm looking for, or there are multiple versions of the part (for different trim levels or engine numbers) even in the same model year, or I don't know what they're calling the part I want. In that case, I like to use a third-party OEM parts seller that has diagrams. In this picture I'm using toyota.oempartsonline.com and looking at the fuel system diagram for a 2000 Corolla.

Say I need one of the two metal bars that hold up the fuel tank, but I can't tell from rockauto's description which is which. See if you can find them here! ---------->

I see that those parts are labeled 2 and 3, and then find them on the list below. I see that the OEM part number for the right strap is 77601-02020 and the left one is 77602-02020. Number 3 on this diagram is an obsolete part only used in December of 1998, so I probably don't need that. Let's hope not.

I can buy it from this site or find it somewhere else--I can even search the number on rockauto to narrow down the results I already saw there.

(Sometimes you'll see a part that says it's been "superceded" by a different part. More on that later.)



No.		Part # / Description / Price	
2		**Fuel Tank Mount Strap** ~~MSRP $47.59~~ **$35.76** Price Leblanc Toyota 77601-02020 Fuel Tank Mount Strap, Right	ADD TO CART
2		**Fuel Tank Mount Strap** ~~MSRP $46.56~~ **$34.99** Price Leblanc Toyota 77602-02020 Fuel Tank Mount Strap, Left	ADD TO CART
3		**Fuel Tank Insulator** Price Leblanc Toyota 77681-02010 Fuel Tank Insulator, Left From 12/98. To 12/98.	Discontinued

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INTERLUDE: THE RETURN SCAM

Say I need a part quickly, but don't want to pay twice as much to get it at a part store. So long as it doesn't have MASTERPRO or something stamped on it in big letters, I can buy the part at the store and then order one on the internet at the same time. I install the part I got from the store, and when I get the one I ordered, I put it in the box and return it to the physical store to get my money back. So in the end, I only spent what I would have spent to order it. I order one of a similar quality to the one I got at the store, because I think it's unethical to return even worse garbage in place of whatever junk the parts store sold me, only to have it fail when someone else puts it on their car.

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DEALERS

If the diagrams aren't helpful or I still can't find the part, it's time to find a dealer and call their parts department. Their databases include, not just part numbers, their descriptions, and an interchange of what fits what, but information about what parts are on each individual vehicle they sold. You give them the vehicle ID number (VIN) of the car you're working on, and they can find out what part was on it when it left the factory. They'll have a diagram, so if you need one of the six inverter cooler hoses on the 2009 Prius, which are described by the manufacturer only as "inverter cooler hose 1-6", you can say, "I need the coolant hose that goes from the bottom right corner of the radiator to the inverter cooler."

It's not in their interest to give you the part number so you can buy it from someone else, but they usually will. The easiest way is to say, "so the part number for that is [random OEM part number], right?" This has an added feature, that then you can say "oh, that's not what I have, I'm going to have to get back to you on this." If they ask you if they should order it for you, you can always say, "I have to talk to the customer first, I'll call you back."

The problem with the dealer is that they're run by a car company, which doesn't want to sell any parts at all; they want to sell new cars. They don't have much incentive to make their databases usable and their diagrams correct, and when they do sell parts, they have a strong incentive to give a single part number to an assembly that contains many individually replaceable pieces. For example, the 2012 Nissan Xterra front door latch has three cables that run from it to different parts of the door, and none of those cables have part numbers. They're included in the door latch assembly and not sold separately. So don't be too surprised if the person you talk to is as confused as you.

USED PARTS

Say none of this works at all. The part you need isn't made any more and its number has been lost to the ages. It's not a hose or O-ring or something you can use a standard version of. You have one way left, and that's to get a used one. (I haven't done this as much, and there are probably tricks I don't know about.) I like to use car-part.com, which is a database of junkyard inventories. You search for a part by description, not by number, and you'll see a list of junkyards that think they have it. You call the number and ask if they have it, how much it costs, and if they can ship it to you or if you have to pick it up.

You can also try a junkyard that lets you pull the parts yourself--they won't know what parts they have, they'll just know they have the car you want, and you can go see if the part you need is on it. Very fun and satisfying when it works, but takes a long time and often (here in the north, at least) the part you need is gone or in worse shape than your old one.

TROUBLE SPOTS

Here are a few situations where you might have trouble.

You need an electrical connector:
these don't always have OEM part numbers. Car companies don't make them or commission them, they just buy them from an electrical supplier, and they don't always keep track of which kind they used. You can try searching the internet for "injector connector" or "[injector's part number] connector," for example, or you can try to find the number assigned to that connector by the electrical supplier. If you search for "Identiconn connector identification utility" you'll find a website that helps identify them. If you can find the general kind of connector you need but not exactly the right shape, you can sometimes figure out what kind of individual pin was used in the connector, and usually you can get the pins out and replace them individually if you have to.

Midyear split or differs by trim level or location:
if you see parts listed with a note like "up to 3/1/99", "Engine Family Number 8FJXV02.5MTC", "Japanese built", "California emissions", or a trim level like "LX", you need more than the model and year. You can search for a VIN decoder, which is a website that takes the VIN and spells out the information it contains, like where and

when the car was built, what trim level it has, and sometimes what engine it has. Engine and transmission numbers might also be stamped on a plate on the engine/transmission or printed on a sticker somewhere under the hood.

Superceded part:
if a manufacturer has to do a recall, say of a fuel pump, or if they want to make an improved design that fits where the old one did, they have to make a whole new batch of fuel pumps, and often they'll give that batch a different part number. You might see something like "G1022-514 discontinued. Superceded by G1022a-514." This can cause a problem if you're searching for a part number alone.

Not factory stock:
I used to have a '95 Mercedes E300D, and for some reason the front wheel bearings weren't the ones the '95 E300D came with, they were a different size. Luckily, there was a part number on one of them, and I searched for that and found that it came on the '93 model year, so I found what I needed that way. That happens sometimes. In my case, it might have been that a previous owner needed a new steering knuckle and couldn't get one for a '95, but figured out that the '93 steering knuckle fit the suspension the same way, or close enough; only the spindle was different, so they had to use a different hub and bearings, and maybe a different wheel. If you have some guesses about what a part might be, it can help to go to the part store and ask to look at a bunch of different parts.

Someone else's mistake:
it happens a lot. You get broken parts new from the factory, the retailer sends you something you didn't order, their interchange is wrong and the part doesn't fit, someone else put the wrong thing back in the box and returned it, or there's a midyear split the parts store didn't know about and you need a different belt that's 15 mm longer than what they gave you. If something doesn't make sense, sometimes going back to the store and getting another one clears it up.

SERVICE DATA

When the pros go to do a job they've never done before, they don't just wing it, they look it up in a database that tells them the major points they need to know: what order to do things in, how tight to make the bolts, and what not to do so they don't break anything. There are a few places to get that.

The first is the factory service manual made by the manufacturer, which you can sometimes find for free online, either by searching "[type of

car] FSM" and combing through the first few pages of results to find something that's real, or by searching on a forum dedicated to that car. They're very accurate, and the older ones are great, but newer ones can be hard to navigate.

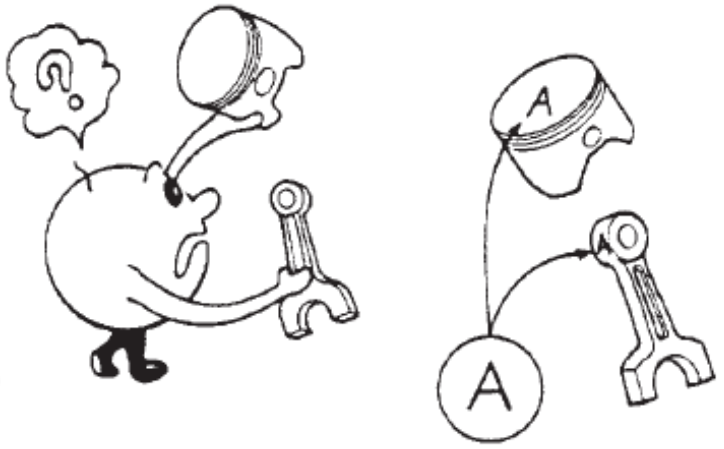
The second is a database like Alldata; your public library might subscribe to a service database you can use.

The third is an aftermarket repair manual, usually made by the companies Haynes and Chilton. They're for the DIY mechanic, so at the beginning of the chapter on each system of the car, they'll have a brief explanation of what all the components in that system do, which is helpful. On the other hand, some of those books are notoriously inaccurate, it depends on the car, so you might look into that before you use one. (I remember when a friend's manual for the 1985 Ford Ranger diesel said to remove the rear axles from the differential "with a slide hammer"--when actually there's a retaining clip inside the diff that has to be taken off! Luckily someone was there who knew the truck and made sure no one smashed the diff with a slide hammer.) You can buy them at parts stores, and sometimes find them for download on the website Libgen, but it's an international site so a lot of those are for overseas models.

There's also youtube and forums, which have both the best and worst information.

A HUMBLE APPEAL

Like I said, my first car was a '95 Mercedes diesel. I loved that car. One of the things that made it so fun was that parts were expensive and hard to find, so it was almost always worth it to try to fix my broken parts instead of replacing them, or to delete them and use something else instead. When the radio stopped working, I took it out and ran wire from the connector to bring power to a 12 volt boombox sitting in the front seat. I would play tapes on it, and the passengers would carry it on their laps. If you only ever replace parts with the same thing, I think you're missing out.



(courtesy Ford Motor Company)

Good luck out there!